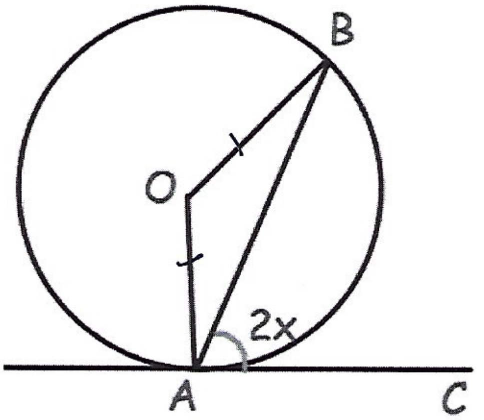
29th March

A and B are points on the circumference of a circle, centre O.



AC is a tangent to the circle.
Angle BAC = $2x$

Prove that angle AOB $= 4x$

Give reasons for each stage of your working.

$\angle OAC = 90°$ (radius/tangent)

$\angle OAB = 90 - 2x$ (angles at a right angle.)

$\angle OBA = 90 - 2x$ (isosceles Δ)

ΔOAB – angles add to $180°$

$180 - (90-2x) - (90-2x) = \underline{4x}$

$\angle AOB = 4x$ QED

Solve

$8^{0.5y} \times 32 = 4^{9-5y}$

$(2^3)^{0.5y} \times 2^5 = (2^2)^{9-5y}$

$2^{1.5y+5} = 2^{18-10y}$

$1.5y + 5 = 18 - 10y$

$11.5y = 13$

$y = \frac{26}{23}$

Factorise fully $x^3 - 6x^2 + 11x - 6$

$f(x) = x^3 - 6x^2 + 11x - 6$

$f(1) = 1 - 6 + 11 - 6 = 0$

$\therefore$ $(x-1)$ is a factor

$(x-1)(x^2 + bx + c) \equiv x^3 - 6x^2 + 11x - 6$

$c = 6$

$(x-1)(x^2 + bx + 6) \equiv x^3 - 6x^2 + 11x - 6$

$bx^2 - x^2 = -6x^2$

$\therefore$ $b = -5$

$(x-1)(x^2 - 5x + 6)$

$(x-1)(x-2)(x-3)$

